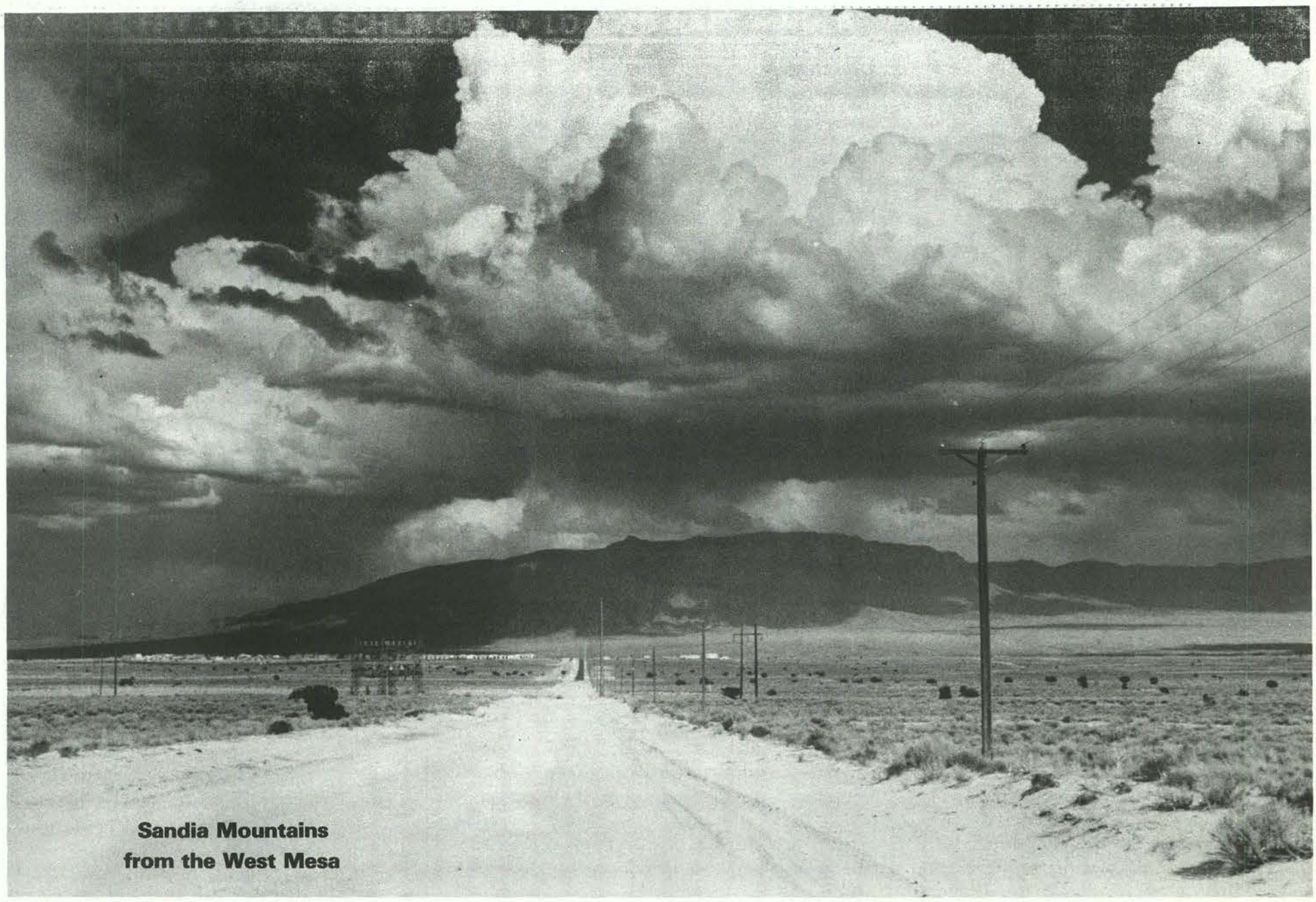


Sandia Mountains
from the West Mesa

SANDIA LAB NEWS

VOL. 29, NO. 13 JULY 1, 1977

SANDIA LABORATORIES • ALBUQUERQUE NEW MEXICO • LIVERMORE CALIFORNIA • TONOPAH NEVADA

Sandia Lab's Pilot Plant To Produce Benign Sludge

Construction begins at Sandia later this year on a pilot facility to be used to explore the economic and scientific aspects of treating sewage sludge with gamma radiation.

Disposal of sludge, a long-standing municipal problem in the country, was recently complicated by new environmental laws which prohibit dumping of sludge into oceans or navigable waters after 1981. The problem may be overcome, however, by use of advanced composting techniques that greatly reduce sludge volume, making it possible for sludge to be economically treated with ionizing radiation. This treatment would reduce pathogens to a level that would permit composted sludge to be used as a fertilizer or soil conditioner in the food chain.

Successful radiation treatment of the dry sludge would produce a soil conditioner which could be retailed for $60 to $70 per dry ton. In its present form, composted sludge sells for $10 to $15 per ton, but costs $30 to $50 a ton to produce.

The new pilot facility should be completed before spring of 1978 and will be the first unit capable of handling several tons of dry sludge daily on a flow-through rather than a batch system basis. It is seen as the forerunner to a full-scale plant, scheduled to be designed next year for construction in the eastern United States.

In the Sandia facility, 30 to 60 pounds of sludge will be loaded into buckets suspended on a conveyor. The buckets will then be conveyed into a high radiation zone where they will pass over and under a gamma-radiation source—approximately one megacurie of cesium-137. Twenty buckets will occupy the irradiation zone at one time.

Doses from a few thousand up to several million rads will be applied by varying conveyor speed. Current research indicates that a dose of one million rads, possibly less, should virtually eliminate pathogens from the final product.

The success of this technique and its wide-spread adoption would mean that cesium-137—now a waste product of nuclear power reactors—could be converted to a beneficial use. Projections indicate that most of the cesium-137 produced through the 1990s could be used in dry sludge treatment.

Gamma rays from cesium are not energetic enough to induce radioactivity in the sludge. Photons of about 10 million electron volts (MeV) are required to induce radioactivity; energy of cesium-137 photons is 0.66 MeV.

Research at the experimental irradiator will focus on factors which maximize pathogen reduction at reasonable cost while maintaining nutrient value of the sludge. This will include studying optimum water content and total radiation dose.

The irradiator will be able to treat sludge which has been dewatered by air drying, centrifuge, or filter press. Both raw and digested sludge will be treated.

(*Continued on Page Five*)

NEW SUPERVISORS: George Merren (1222), Ron Syler (1732) and Gene Brault (2601).

Supervisory Appointments

GENE BRAULT to supervisor of Data Base Management Division 2601, effective July 1.

Gene joined the Laboratories in April 1976 as a member of the staff of the organization which he will now supervise. The group is responsible for the development of the Corporate data base. Before coming to Sandia, Gene had been director of northwest operations for Computer Sciences Corporation.

He earned his BS degree in economics from Los Angeles State University and has completed most of the requirements for an MBA from the University of Washington. Off the job, Gene enjoys gardening, golfing and working in Little League baseball. He and his wife Shirley have eight children, two in college and the others at home. They live at 7913 American Heritage N.E.

* * *

GEORGE MERREN to supervisor of Systems Reliability Division 1222, effective June 16. Since coming to Sandia in 1958, George's work has dealt chiefly with systems reliability, with two exceptions: a one-year special assignment in Washington, D.C. working on a reactor safety study; and, for the past 11 months, he has been on the W80 Development Division staff.

A De Vry Technical Institute graduate, George furthered his education at the Labs under the Educational Aids Program, earning a BS in EE from UNM in 1969.

He is a member of IEEE, ASQC and the Systems Safety Society. His primary interests off the job are photography, hunting and fishing. George and his wife Alice have two sons and live at 1101 Alameda Road NW.

* * *

RON SYLER to supervisor of Systems Development Division 1732, effective June 16. Since coming to Sandia in 1958, most of Ron's work has been in systems engineering. His assignments have included rocket instrumentation work on Johnston Island, ground support systems for upper atmospheric testing, two years with the JTF-2 program, and work on the Vela project. For the past four years, Ron has been working on BISS (Base and Installation Security Systems), a reimbursable program for the Air Force. Continuation of the BISS contract will be Ron's responsibility in his new position.

Ron earned a BS in EE from the University of Arizona. For recreation he enjoys skiing, fishing and trail biking. He and his wife Nelmah have two children and live at 1416 Gretta NE.

LAB NEWS

Published every other Friday

SANDIA LABORATORIES

An Equal Opportunity Employer

ALBUQUERQUE, NEW MEXICO
LIVERMORE, CALIFORNIA
TONOPAH, NEVADA
Editorial offices in Albuquerque, N.M.
Area 505 264-1053
FTS 475-1053
ZIP 87115
In Livermore Area 415 455-2952
FTS-469-2952

john shunny is editor
&
don graham ass't. editor

bruce hawkinson & norma taylor write
bill laskar does picture work
so does russ smith
&
lorena schneider reports on livermore

At Livermore Labs

ABWA Honors Betty Dietrich

Betty Dietrich (8411) was recently named "Woman of the Year" by the Livermore Valley Charter Chapter of the American Business Women's Association. Selection is based on the member's achievement in her chosen field, participation in the association and other factors.

Betty has served ABWA in many capacities including chairwoman of ways and means, social, membership and nominating committees. A secretary at Sandia for over 16 years, she is currently secretary to Data Processing Division 8411. Previously, she was a long distance operator and service representative for PT&T in Livermore and, during WWII, was a trans-Pacific telephone operator in Hawaii.

In October, Betty will represent the local chapter in competition for the 1977-78 Top Ten Business Women of ABWA and the American Business Woman of the Year award at the ABWA national convention in Salt Lake City.

Speakers

John Brooks (8314) and A. W. Thompson (Carnegie-Mellon University), "Effects of Aging on Hydrogen Performance of Commercial A286," Annual Meeting, Metallurgical Society of AIME, Mar. 6-10, Atlanta, Ga.

Wes Estill (8314), "Electron Microprobe Computer Imaging," Eighth Annual Meeting, Society of Electron Microscopy, Feb. 10, San Francisco, Calif.

John Vitko (8334) and Charles Hartwig (8342), Invited Colloquim: "Hydrogen Gas Interactions with Vitreous Silica," Xerox Research Center, Feb. 25, Palo Alto, Calif.

Walt Bauer (8334), Invited Talk: "Role of Surface Science in Thermonuclear Fusion," Surface Science Workshop sponsored by the Materials Science Program of the Division of Physical Research, ERDA, at Lawrence Berkeley Laboratory, Mar. 16, Berkeley, Calif.

Ted Dellin (8342), "Stress Relief in Electron Irradiated Vitreous Silica," and Charles Hartwig and Larry Rahn (both 8342), "Anomalous Hydroxyl Modes in Vitreous Silica," American Physical Society meeting, Mar. 21-24, San Diego, Calif.

Ken Dolan (8344) and Jim Chang (5242), "Microchannel Plate Response to Hard X-Rays," Joint Technical Symposium, Society of Photo-Optical Instrumentation Engineers and Society of Photographic Scientists and Engineers, Apr. 18-21, Reston, Va.

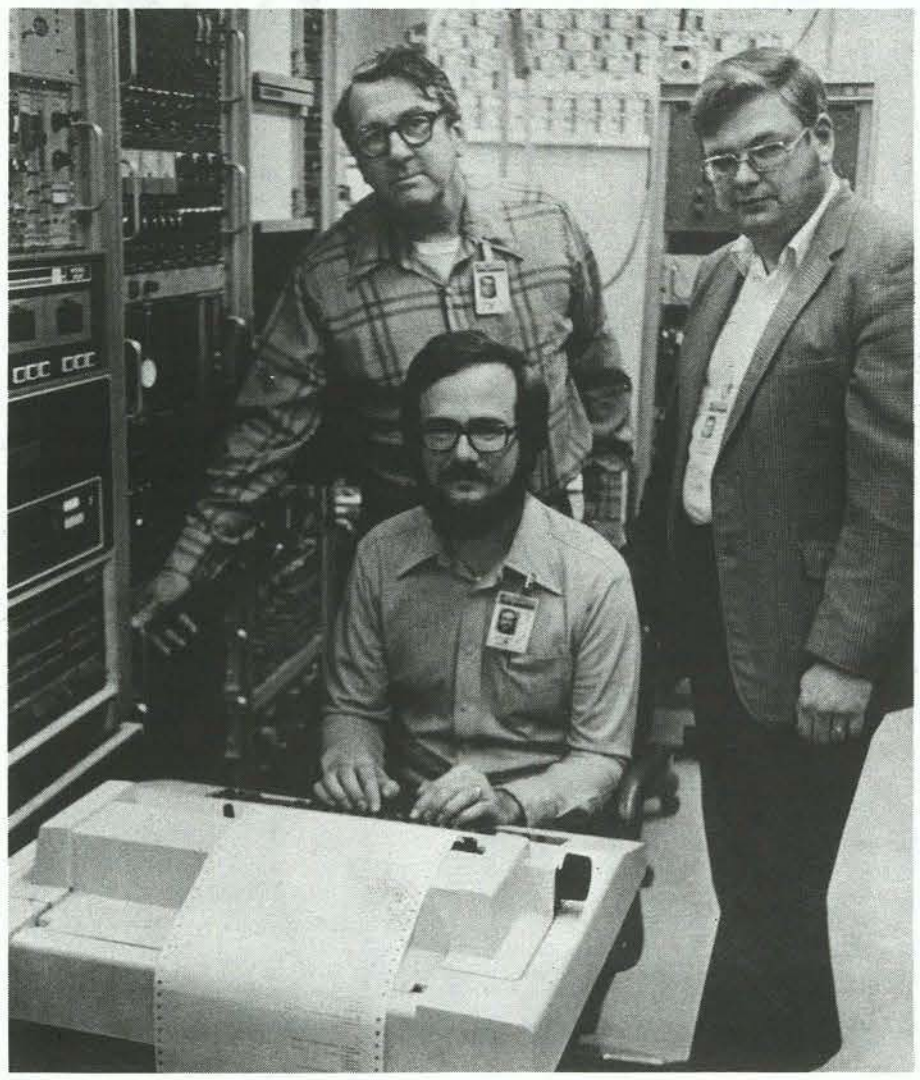
Ken Hicken (8423), "Principles and Applications of Electron Beam Welding" and "Resistance Forge Welding," Practical Welding and Brazing Technology Clinic sponsored by Society of Manufacturing Engineers, Mar. 22-24, Dearborn, Mich.

John Smugeresky (8312), "Microstructural Characterization of Segregation in JBK-75," and "Beryllium as an Engineering Material: Where It Is and Where It Is Going"; John Smugeresky and Rand German (also 8312), "The Consolidation and Properties of Hot Isostatically Pressed A286 Stainless Steel"; and John Smugeresky and S. M. Myers (5111), "Low Temperature Solubility of Copper in Beryllium Using Ion Beams," Annual Meeting, Metallurgical Society of AIME, Mar. 6-10, Atlanta, Ga.

Dan Dawson (8314), "Fatigue Crack Growth in Titanium Alloys in Methanol-Water Solutions," National Association of Corrosion Engineers Research Conference, Mar. 14-18, San Francisco, Calif.

Jim Rogers (8322), "Internal and External Decision and Control Methods for DIVWAG Scenario," 38th Military Operations Research Society Conference, Dec. 7-9, Ft. Eustis, Va.

Image Enhancement Applied to Electron Microprobe Data



ENHANCING THE IMAGE of electron microprobe data are Hilary Jones (8322) at the keyboard, Wes Estill (8314), left, and Don Benthusen (8342).

Two Sandia Livermore scientists have applied techniques of image enhancement to electron microprobe data. They are Hilary Jones of Numerical Applications Division 8322 and Wes Estill of Materials Development Division 8314. While image enhancement has wide application in a variety of experimental situations (the most familiar being the Mariner photographs of Mars), this is the first time the technique has been applied to microprobe data.

An electron microprobe is used to obtain chemical composition information from small volumes (10^{-4} cm^3) of materials such as individual particles, thin films, or small regions of interest within bulk materials. With the electron microprobe, the surface of a solid sample is bombarded with a fine beam of focused electrons, generally one to two microns in diameter. The characteristic X-rays which are emitted by the sample are converted to a signal which is measured and saved in a minicomputer's memory for subsequent analysis.

Since the beam strikes only one point on the sample at a time, the beam must be made to scan the surface in a raster pattern, as on a TV screen, to generate an X-ray intensity picture of the sample's surface. Typically, the Sandia instrument collects data over a 40 x 40 array of points, resulting in an image composed of 1600 data values. Each value gives a measure of the quantity of a selected element at that point in the array. With the conventional electron microprobe, X-ray data is acquired rapidly and displayed immediately on a fluorescent screen in the form of an image. However, data acquired in this manner can lead to noisy images if the counting statistics are unfavorable. In addition, the image obtained is not amenable to further processing to remove noise, enhance certain features, and obtain quantitative information.

Jones and Estill have succeeded, with the assistance of the CDC 6600 computer, in converting the X-ray image from the microprobe into a more useful display. Various techniques are used to accomplish this, including smoothing of the data to give a highly realistic representation of the sample surface, and removing of blur and other image-degrading processes from the raw data. The X-ray data is converted into quantitative information using a computer program (MAGIC IV) which takes into account the X-ray matrix material interaction. These X-ray corrections are necessary in certain chemical composition ranges in order to image the relative elemental distribution correctly.

Assisting Jones and Estill in the development of this technique was Don Benthusen (Device Studies Division, 8342), who designed and fabricated the electronics and developed the necessary software to interface the microprobe to the minicomputer.

LIVERMORE NEWS

VOL. 29, NO. 13 LIVERMORE LABORATORIES JULY 1, 1977

SANDIA'S BOARD OF DIRECTORS held their annual meeting in Livermore June 9. Following the meeting, the Board toured SLL research facilities for briefings by the staff. Above, Don Hardesty (8351) describes coal combustion experiment to (from left) Kenneth McKay, Executive Vice President of Bell Labs; Guy Accettura, EVP WE; Joseph West, EVP WE; President Sparks; and Donald Procknow, Pres. WE. Right: Mr. McKay checks sound powered phones in computer area.

Congratulations

Mr. and Mrs. Ron Stoltz (8314), a son, Mitchell Leff, May 23.

Take Note

Can you spare some time? The Mental Health & Mental Retardation Center, associated with UNM's School of Medicine, needs volunteer help in a number of areas: direct patient care, crisis desk, reception desk, medical records, outpatient clinic, day treatment, and programs for children. Vehicle drivers are also needed. Typical activities include showing movies to patients, teaching a craft, driving patients to church on Sunday, and the like. You need not have any special training or skill—just a willingness to help out for a few hours each week. The volunteer coordinator is Pat Sandoval and she can be reached on 843-2870. Visitors are always welcome; Pat's office is at 2600 Marble NE.

* * *

The New Mexico Symphony has begun its season ticket sales for the coming 77-78 season. Eight concerts are planned, with two performances each, starting early October and concluding in April. Subscribers save up to 31% of single ticket costs and may sign up for either four or eight concerts. Call the Symphony office at 265-3689 for further information.

* * *

Cinderella is usually a children's story. But when Albuquerque Children's Theatre does it, it's a little different. Directed by John Gardner (3144) of Classics Theatre fame, it's definitely for adults as well as kids. At Popejoy July 9 and 10, 1:30 and 3:30; tickets are $1.50 at the door.

* * *

Felix Padilla (3421), LAB NEWS cartoonist, is rapidly building a national reputation as a fine artist. His latest honor was "Best of Show" in the Hotchkiss Fine Arts Black Canyon Painters Parade, Hotchkiss, Colo., a national competition. Felix entered a large acryllic landscape painting of "Taos Country."

* * *

The Base gets a new boss today, July 1, when jurisdiction transfers from Air Force Systems Command to Military Airlift Command, appropriately known as MAC. The Air Base Wing will change its designation on that date, from the 4900th to the 1606th Air Base Wing. Change of command ceremonies are scheduled today at 9 a.m. on the parade grounds.

* * *

Sandia's parent company, Western Electric, has come up with a contract which bears an impressive number: $400,000,000. The release states that the contract was signed with the Saudi Arabian government to build a major microwave communications system in that country. WE was one of five teams from the U.S., Europe and Japan to bid on the project. Completion time is estimated to be 30 months. Work begins immediately.

CONNIE GARCIA and eight-month-old daughter Amy. Connie is completing her junior year at New Futures, will return to her former school next fall. The day care program has made it possible for Connie to attend New Futures School.

Our Town

A New Deal For Pregnant Teenagers

The New Futures School does what its name says—provide a new future by enabling a young person to finish school. This APS facility offers teachers and a curricula to pregnant teenagers and teenage mothers who want to obtain a high school diploma. Pregnancy is the single greatest cause of girls dropping out of school.

Started in 1970, New Futures was first of its kind in Albuquerque, and its enrollment (250 this year) has since increased markedly. Beyond the customary high school courses, the school offers additional services:

—breakfast and lunch (good nutrition means healthier mothers and babies)
—classes in nutrition
—pre- and post-natal instruction
—a day-care center for those young mothers who have no place to leave their babies
—counseling, for the girls, the prospective fathers and for the parents of the young couples.

The counseling function is especially important. Whether married or not, the relationship between girl and boy under such circumstances tends to be unstable. Sometimes both parties drop out of school, the prospective father doing so in order to get a job to support his new family. But without a diploma he all too often ends up with no job or a low-paying one. Under these conditions there is a good probability that the family will end up on welfare.

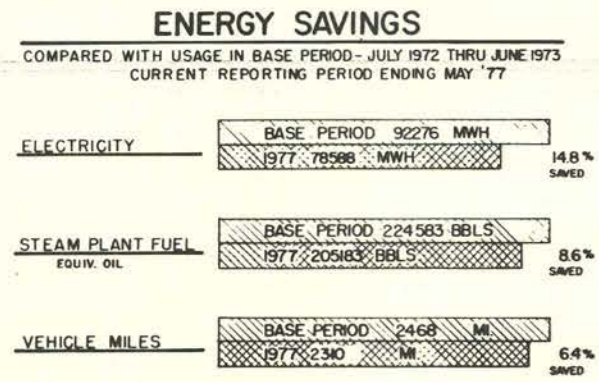
"We try to teach them how to accept parenthood and to be good parents," says Carolyn Gaston, program coordinator at the school. "One of every five babies born in Bernalillo County is to a teenage mother," Carolyn continues. "This is in line with the national figures."

The national figures are sobering:

—nearly one million teenage pregnancies each year
—teenagers account for one-fifth of all births, 52% of out-of-wedlock births, and one-third of abortions
—of 595,000 births to teenagers in 1975, nearly 13,000 were to girls age 14 or younger
—mothers under 16 have increased 80% since 1960
—teenage mothers attempt suicide at a rate seven times that for all women in their age group.

New Futures is cost effective: healthy mothers and babies require less hospitalization; young parents with marketable skills don't end up on welfare; and the program of instruction reduces suicide, abortion and veneral disease among teenagers.

The New Futures School is located in the old Albuquerque High building. Funding is largely dependent upon grants and donations. Call Betty Perkins at the First National Bank (downtown), or Carolyn Gaston at the School to make a donation.



832 Goes Solar

It was an occasion marked by no ceremony, but the event is worthy of note. On Friday, June 24, Bldg. 832 switched from its conventional power sources to total solar: all electrical and thermal energy used for lights, air conditioning and other purposes in the building now derives from sun power. The array of parabolic collectors east of Bldg. 832 is the basis of the system. The building is the largest yet to be solar total-energy. Supervisor of Solar Total-Energy Test Facility Division 5712 Jim Leonard reports that the system is still experimental and that conventional power remains the primary source.

Business Administration MA Available from 'Next Door'

Sandians interested in earning a Master of Arts degree in Business Administration now have a unique opportunity. There is a University next door.

New Mexico Highlands University offers this program with all classes held in the KAFB Education Bldg. 602, directly south of Bldg. 805. Classes are held Mondays through Thursdays from 5:30 to 8 p.m.

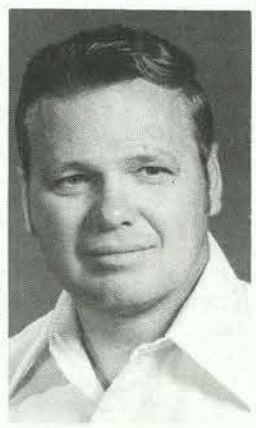
Dan Poole of Education and Training Division I 3521 reports that under the Educational Aids Program Sandia will pay 100% of tuition costs for qualified employees enrolled in the Highlands program. Anyone interested should see Dan right away in order to complete the necessary forms in time to start the next quarter session Aug. 19.

Emphasis in the Highlands program is management of business. Requirements for the program include completing 48 quarter hours of course work—eight are "core" courses such as managerial accounting, financial management and managerial economics. The rest are electives such as organization theory and management systems.

Highlands offers five eight-week quarter sessions per year. Theoretically, it is possible to complete the program in 14 months. No thesis is required.

Director of the Highlands program is Bob Beebe. He is available for counseling in Bldg. 602, Rm. 138, Mondays through Thursdays from 2:30 to 8 p.m.

Death



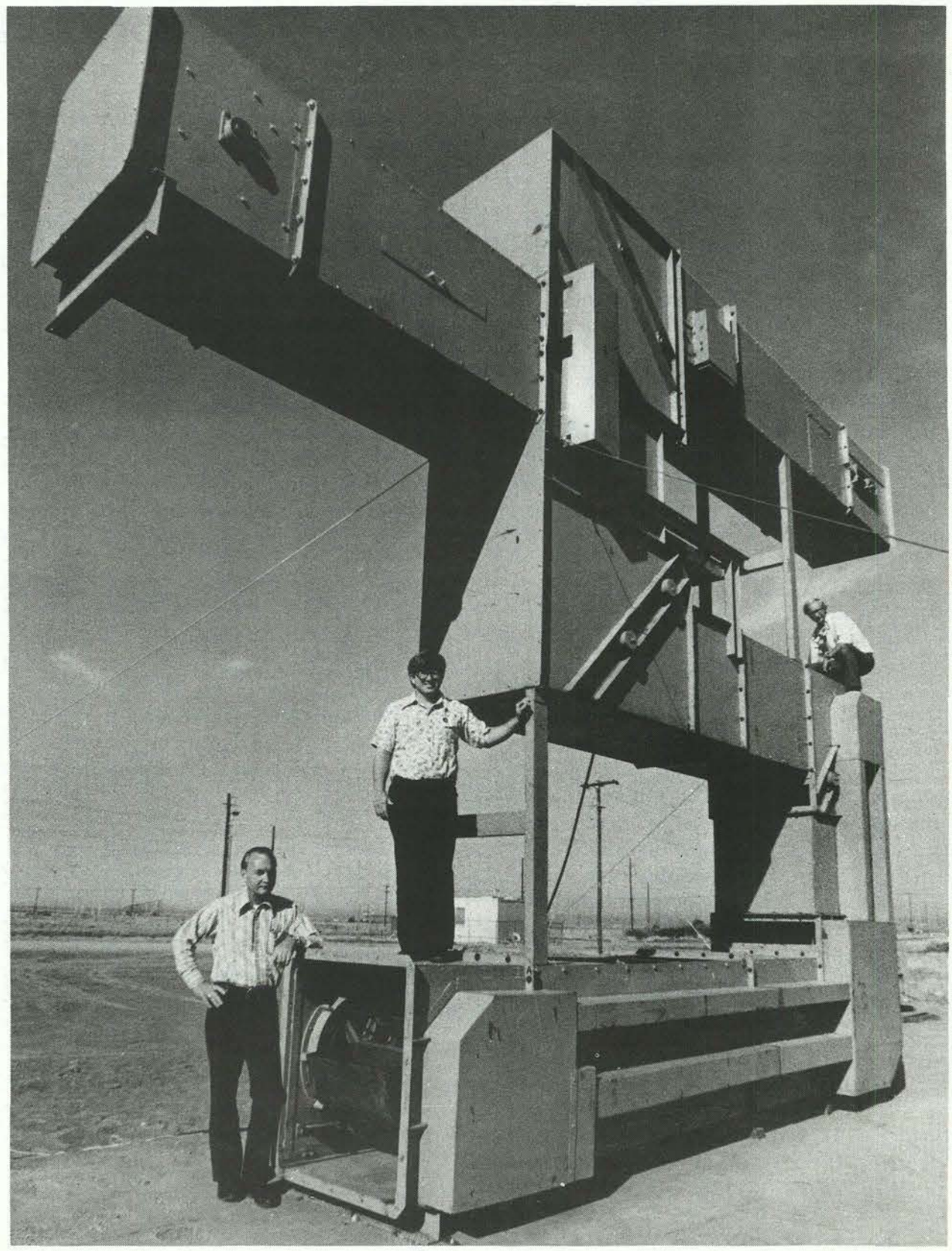
Robert Stewart of Plastics Section 9572-5 died June 15 after a long illness. He was 41.

He had worked at the Labs since August 1955.

Survivors include his widow, three daughters, a son and two grandchildren.

Sympathy

To Jim Ruttle (9483) on the death of his mother June 14 in Albuquerque.



SLUDGE CONVEYOR will be one of the principal elements of pilot facility in which sludge will be irradiated to eliminate pathogens. Aim is to produce material suitable for use as a fertilizer or soil conditioner. From Beneficial Uses Program Division 5445, Jack Sivinski, Marvin Morris and Jim Pierce stand with machine.

Continued from Page One

Sandia Pilot Sludge Plant

"What we seek is a product that is inoffensive, non-toxic, and non-polluting, and actually useful in a hungry and energy-deficient world," says Jack Sivinski, supervisor of Sandia's Beneficial Uses Program Division 5445.

Los Angeles and several other cities already use composted sludge for soil-conditioning. Other cities—Philadelphia, New York City, Washington, D.C. and Camden, N.J.—are considering the composting process.

Sludge disposal problems are coming to a head, Sivinski says. "First, the ocean dumping of sludge by coastal cities is to be mostly phased out by 1981," he says.

"To compound the problem, Public Law 92-500 requires secondary wastewater treatment for all effluents discharged into navigable waters. Studies show that this treatment will double the 1970 sludge output of the U.S. by 1985.

"Also, increased energy costs are making disposal schemes such as incineration impractical. Air pollution standards further limit the use of incineration. Using sludge as landfill—widespread in the past—presents problems too."

Although the irradiation of composted sludge appears to be the most efficient waste management system for some parts of the U.S., Sandia researchers believe the use of thermoradiation—the simultaneous application of heat and ionizing radiation to treat wet sludge—may be the system of choice in other areas.

Sandia pioneered the use of thermoradiation as a sterilizing technique, and investigations continue to determine its advantages in treating sludge to make it suitable as a plant or animal food. Experiments to determine the value of irradiated nondigested sludge as a food supplement for ruminant animals are under way with researchers from New Mexico State University.

Credit Union Operations

By Clarence Sandy, President
Board of Directors

Your Credit Union is a complex financial structure operating with assets in excess of 30 million dollars. To put this figure in perspective, the Credit Union is financially larger than six of the 12 Albuquerque banks. And, like a normal business enterprise, the Credit Union operates with its own people who have their own retirement and vacation plan, sick leave and other benefits. Unlike other business operations, however, most of the policy decisions and much of the auditing, supervision and credit risk assessment is done by people—volunteers—from Sandia Laboratories.

We think an explanation of the operations of your Credit Union would interest the membership, and we plan a series of articles in the LAB NEWS on the subject. We'll cover the work of the various committees and give the background on policy matters. For instance, "Why don't you pay higher dividends?" Or the corollary, "Why don't you have lower interest rates?" Or, "How do you determine the amount of money held in undivided earnings?" There are reasonable answers to these questions and we hope members will make a point of reading them as they appear in this column.

If you have a question you would like to see discussed, please contact a Board member of the Credit Union with your request. Board members are Marv Daniel (4362), Bill Bristol (Credit Union), Ralph Hampy (2151), Willy Garcia (3163), Joe Ruggles (4277), Joe Maldonado (9713), Bill Olheiser (ret'd.), Alan Pope (ret'd.), at SLL Don Wagner (8212), and myself.

Signing In: Not Quite Fun But Improving

Most of us have successfully repressed the pleasures we experienced during our hiring-in process. "This is the security videotape. It's very important. . . . This is the safety videotape. It's very important too. . . . Here is your fringe benefit package. Do you want Equitable or MASTERCARE? How about Long Term Disability? Accident Insurance? Maybe Second Supplemental Life Insurance? . . ."

While no one can claim the choices are now any easier, today's new hire has a week in which to make them, thanks to some changes proposed by Bob Lassiter of Education and Training Division 3521.

He also helped to revive a half-day facilities tour for all new hires. "It's a sort of Family Day introduction to Sandia," says Bob. In addition, a half-day briefing for all new staff level people will take place every six months. Members of small staff will discuss major technical programs at the Labs.

One other help for the new hire is a booklet compiled by Ann Hogan (3151), herself a new hire. Called *the supporting cast,* it describes the various services available—secretarial, check cashing, education, etc.—and explains the resources available to help employees get their jobs done—library, purchasing, shops, drafting, tech writing, tech art, photo lab, print shop, and the like.

"At least," says Bob, "new hires now have a sporting chance for psychic survival during their critical formative weeks."

Speakers

E. G. Thuman (2601), "Long Range Planning for Data Processing," SIGBDP, May 18, Albuquerque.

J. S. Pearlman (5214), "Plasma Absorption Processes," 7th annual Anomalous Absorption Conference, May 18-20, University of Michigan, Ann Arbor.

L. D. Tichenor and R. W. Weaver (both 9572), "The Truth about CPR (Cardiopulmonary Resuscitation)," Pharmacology Representatives of N.M., April 15, Albuquerque.

E. A. Aronson (2642), "Simulation of a Solar/Wind Energy System," G. Cano (5433), "New Mexico's Energy Resources and its Contribution to the Nation's Energy Base," Rio Grande Chapter, Association of Computing Machinery, May 20, LASL.

D. R. Tallant (5821), "Actinide and Long-Lived Fission Product Isolation from High-Level Liquid Waste Uring Inorganic Ion Exchange Materials," Actinide Partitioning and Transmutation Conference, March 8-9, Oak Ridge, Tenn.

B. L. Butler (5844), "Solar Energy for Home and Pool," Solar Seminar, April 16, Albuquerque.

J. M. Hueter (3521), Keynote address, Vocational Industrial Clubs of America annual N.M. conference, April 22, Albuquerque; "Engineering Careers—Present & Future," ASME Youth in Industry Banquet, April 27, Albuquerque.

E. L. Burgess (5719), "The Performance, Problems, and Expectations of Concentrator Photovoltaic Systems," Solar Energy Short Course, Spanish Center for Energy Studies, May 2-7, Madrid Spain.

H. D. Sivinski (5445), "The Sandia Laboratories' Beneficial Uses Program," Conference on High Energy Electron Treatment of Municipal Wastewater Residuals, May 9-10, MIT, Cambridge, Mass.

R. A. Richards (9621), "Broad Spectrum Applications Resources Network," APPLICON User's Group Meeting, May 16-20, Framingham, Mass.

D. R. Tallant (5821), "Americium and Curium Recovery from High-Level Nuclear Waste Using Inorganic Ion Exchangers," Actinide Workshop, May 18-19, Hanford, Wash.

K. L. Brower (5112), "EPR Studies on Interstitial and Carbon-Related Defects in Irradiated Silicon," State U. of New York, Physics Department, May 23, Albany; Max-Planck Institut fur Metallforschung, May 27, Stuttgart, Germany; and U. of Amsterdam, Physics Department, June 9, Amsterdam, The Netherlands.

M. K. Matzen (5211) and J. S. Pearlman (5214), "Laser-Related Spatial Distribution of Plasma Expansions"; E. C. Cnare, B. W. Duggin, W. P. Brooks, R. I. Butler and W. K. Tucker (all 5233), "Pulsed Power Conversion with Inductive Storage"; J. S. Pearlman (5214), "Angular Dependence of Laser Energy Absorption in Planar Geometries"; D. A. McArthur (5423) and J. V. Walker (5420), "Nuclear-Pumped Laser Concepts for Laser Fusion or Laser-Heated Solenoid Reactors"; K. D. Bergeron, J. W. Poukey (both 5241) and J. P. VanDevender (5245), "Theory of Short Pulses in Long Magnetically Insulated Transmission Lines"; J. P. Quintenz and J. W. Poukey (both 5241), "Time-Dependent Effects in REB Diodes," IEEE International Conference on Plasma Science, May 23-25, Troy, New York.

J. F. Gonzales (9581), "Precision Small Parts Fabrication," SME Precision Machining Workshop, May 23-26, Scottsdale, Ariz.

M. G. Vigil (9335), "Low-Overpressure, Long-Positive-Phase-Duration Flows in a 5.8 Metre Diameter Facility for Simulating Blast Environment from Nuclear Weapons," 5th International Symposium—Military Applications of Blast Simulation, May 23-26, Stockholm, Sweden.

P. B. Rand (5831), "Elastomeric Syntactic Foams for Stress Relief" and "Foams for Safeguard-Development"; A. M. Kraynik (5813), "The Tube Flow Behavior of One Component Sticky Foam Solutions"; A. J. Quant (5813), "The Pros and Cons of Foam Encapsulants"; K. B. Wischmann (5813) and R. A. Assink (5811), "A Removable Encapsulant—Polystyrene Foam," Foam Materials and Processes conference, May 24-25, SLA.

J. W. Poukey, J. R. Freeman and J. P. Quintenz (all 5241), "Mirror Field Effects in Relativistic Diodes," Symposium on Electron, Ion, and Photon Beam Technology, May 25-27, Palo Alto, Calif.

K. L. Brower (5112), "Electron Paramagnetic Resonance Studies of the Lattice Damage in Ion Implanted Silicon," Max-Planck Institut fur Kernphysik, May 26, Heidelberg, Germany; and H. C. Orsted Institute, U. of Copenhagen, June 6, Copenhagen, Denmark.

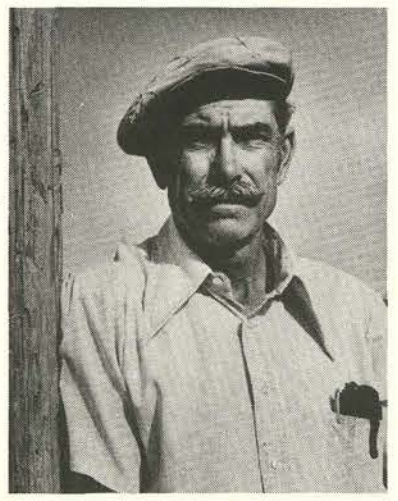
R. A. Schmidt (5163), "On the Prediction of Tensile Strength of Rock from Fracture Toughness or Effective Surface Energy," spring meeting AGU, May 30 - June 3, Washington, D.C.

E. P. EerNisse (5133), "Viscous Flow of Thermal SiO_2 at Device Processing Temperatures, and Photovoltaic Concentrator Systems," GE Corporate Research and Development Laboratory, Seminar, May 31, Schenectady, N.Y.

Retiring

L. T. McKenzie (3431)

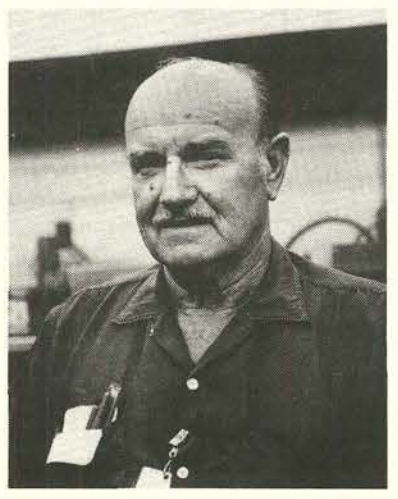
Willa Urbanoski (3252)



Preciliano Trujillo (9718)

Dorothy Raper (3521)

Bernie Larenzen (9743)



Elbridge Baber (9521)

Fun & Games

Sandia Golf Assn.—In last month's Paradise Hills Scramble Tournament, these were winners: 1st place team—Betty Chappell (retd.), Eleanor Kelly (4113), and Phyllis Peterson (2516); 2nd place—Ree Gerchow (4122), Reba Garrison (1320), and Dorothy Calloway (2622); 3rd place—Clara Gearhart (3141), Tess Reis (3212), Earlene Brinegar (3532).

* * *

Bowling—Officers for the coming season in the Sandia Labs Bowling Assn. are Mary Ward (9658), President; J. L. Rogers (9426), VP; and Sadie Hesselden, Secretary-Treasurer. Tournament director for the season will be Wally Granfield (1750) and recreation council rep will be Joe Stiegler (1750).

* * *

Biking & Running—LAB NEWS scrounged a 5-drawer file cabinet and we now have a more-or-less organized library, with an index, of the three magazines devoted to these activities: *Bike World, Bicycling,* and *Runner's World.* The collection dates back to '73 and '74 but, unfortunately, there are many gaps, so if you've been saving your issues over the years and can't figure what to do with them, then here's a worthy resting place. Sandia bikers and runners are invited to come over and browse. And you can take magazines out on loan. Both biking and running magazines contain technical and other articles of permanent value but please—don't call us for literature searches.

The Tour of Los Alamos bike race takes place tomorrow, July 2nd. It features both a 30 and 60 mile course described as "hilly." Call LAB NEWS on 4-1053 if you're interested.

* * *

That T-Shirt Thing—You've rushed through this issue of LAB NEWS looking for the T-Bird T-shirt iron-on decal we promised and it's not here. Don't fret—our printer tells us he should be ready to roll by next issue, so start lining up your T-shirt supply.

Authors

A. D. Middelton (retired), "The Call From Cedro Canyon," Vol. 1, No. 2, HAM RADIO HORIZONS.

M. A. Butler and D. S. Ginley (both 5154), "Correlation of Photosensitive Electrode Properties with Electronegativity," Vol. 47, No. 2, CHEMICAL PHYSICS LETTERS.

P. J. Feibelman (5151) and E. J. McGuire (5211), "Independent Electron Calculation of $L_3M_{4,5}M_{4,5}$ and $M_{2,3}M_{4,5}M_{4,5}$ Auger Lineshapes In Metal," Vol. 15, No. 8, PHYSICAL REVIEW B.

J. W. Nunziato (5131), "Thermal Stability of Chemical Reacting Heat Conductors," Vol. 25, No. 3-4, ACTA MECHANICA.

D. W. Palmer (2151), "Mode Locking in Arrays of Superconducting Weak Links," Vol. 61, No. 2, PHYSICS LETTERS A.

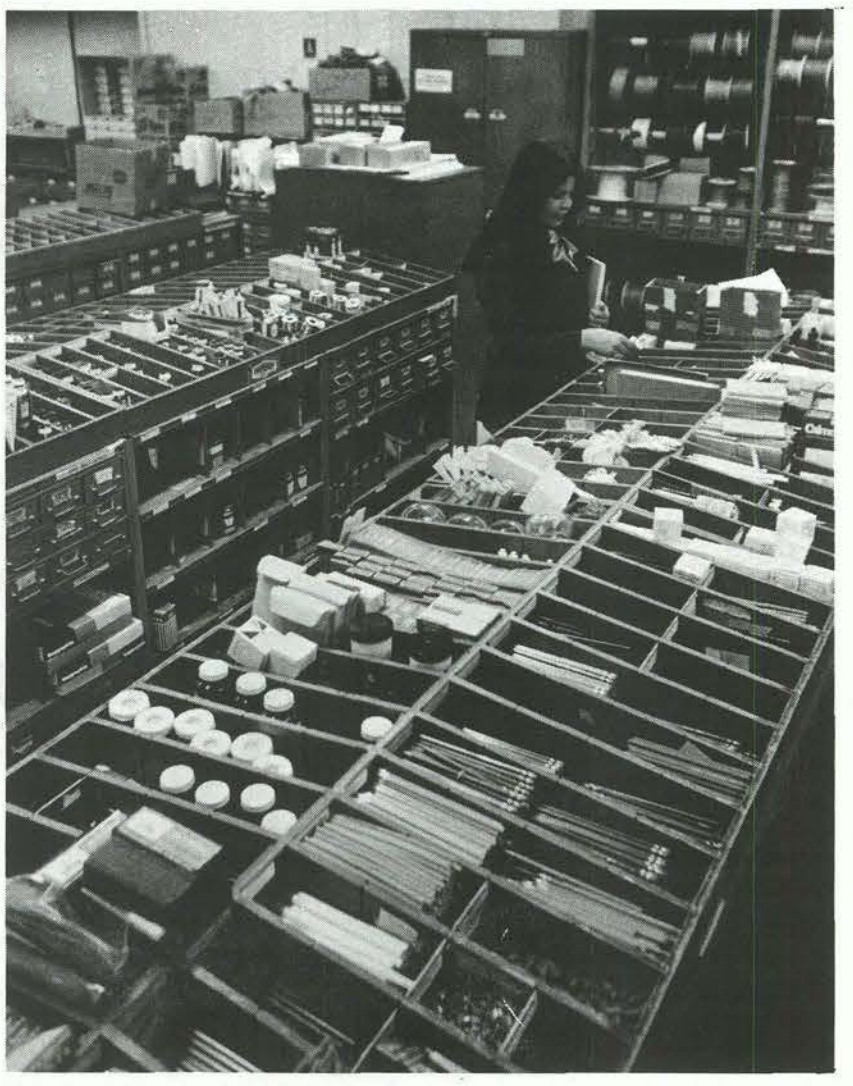
J. P. Quintenz (5241), "Calculation of Non-Cylindrically Symmetric Space-Charge Flow," Vol. 20, No. 5, THE PHYSICS OF FLUIDS.

M. C. Bennett (1331), "Velocity of Bodies Powered by Polyatomic Cold-Gas Thrusters," June 1977, JOURNAL OF SPACECRAFT AND ROCKETS.

Sandians Shop at Self-Service Stores

"A quick and economical supply system." That's how Craig Summers, supervisor of Stores Management Division 3727, describes the six self-service stockrooms at the Labs.

Located in Buildings 802, 880, 891, 894 and two in Area III, the stores are manned by five stockkeepers. They keep their stores supplied by daily orders to General Stores on a Data Phone system. In turn, they receive daily deliveries from General Stores. Each store carries an inventory that averages over 5000 items. Stockkeepers check shelves and bins in each aisle in a rotating system so that supplies are constantly monitored for possible re-ordering. In addition, they rely on the customer sign-out log to stay on top of fast moving items that might require immediate attention.



BOBBIE TAYLOR (2354) likes the convenience of this self-service stockroom located in the 802 basement. Location of and supplies for the six stockrooms were selected to meet the needs of employees working nearby.

"Items on backorder are the biggest problems," Craig says. "When General Stores receives requests—from self-service stockrooms or on individual material requisitions—for an item that is backordered, the requisition is placed in the empty storage area. And, when the material does arrive, those orders are filled immediately. Items become backordered when a supplier, for one reason or another, cannot meet a delivery date; we don't like backorders any better than our customers do.

"We want employees to use those stockrooms," Craig continues. "We do ask that when a large quantity of a particular item is required that it be ordered from General Stores on a material requisition. The stockkeepers are doing a good job of meeting the requirements of their users without over-ordering because they all have limited space."

Questions or suggestions about new items for the self-service stores should be directed to one of the stock analysts in Stock Control Section 3727-2. And Craig adds that he wants to know about any poor quality stock. The self-service stores currently are well stocked and backorders are down so employees should be able to find most of what they need.

Events Calendar

July 1-10—"Stuffed Shirt," Barn Dinner Theatre, 281-3338.

July 1-3—"Oliver," Albuquerque Civic Light Opera, Popejoy Hall, 277-3121.

July 3—NM Mt. Club, Crest Loop Hike, 831-0347.

July 3—Fireworks display, UNM football stadium, 8:30 p.m.

July 8—"Who's Afraid of Virginia Woolf?" KHFM 96.3 FM, 10:10 p.m.

July 9—Aerosmith Rock Concert, Tingley Coliseum.

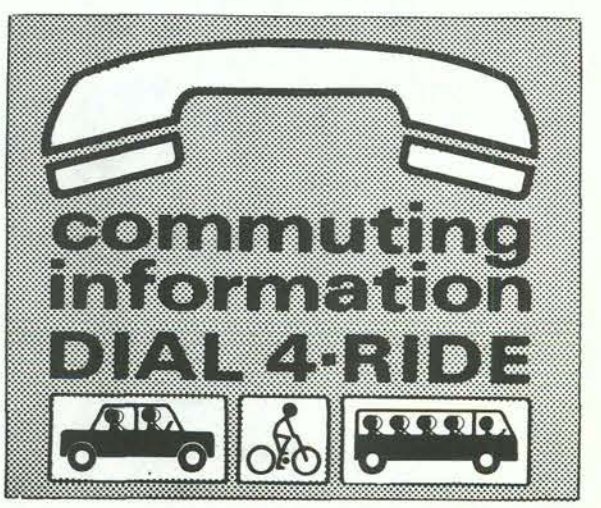
July 9-10—"Cinderella," Albuquerque Childrens Theatre, 1:30 & 3:30, Popejoy Hall, 277-3121.

July 10—The Top Hats, free concert of "Big Band" sounds, Civic Plaza, 2-3:30 p.m.

July 13 - Aug. 14—"Never Get Smart With an Angel," Barn Dinner Theatre, 281-3338.

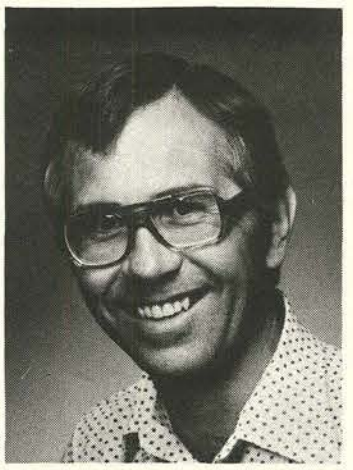
Congratulations

Mr. and Mrs. William Abel (2531), a daughter, Susan Dorothy, June 9.



MILEPOSTS
LAB NEWS

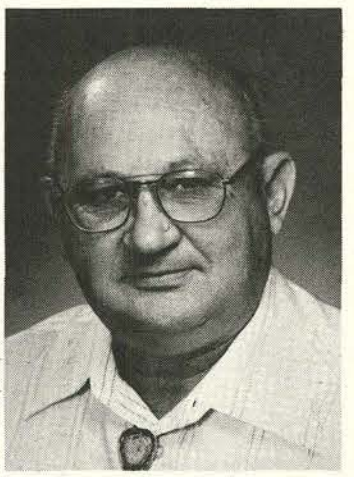
JULY 1977



Daniel Thompson - 3313 10

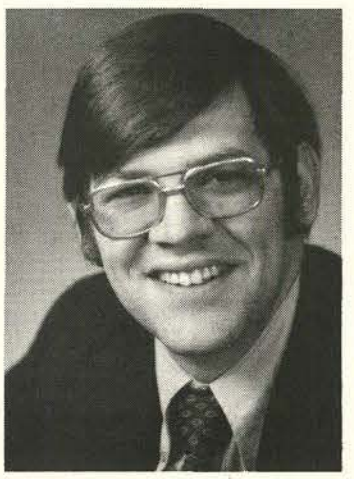
Ron Fugazzi - 2625 15

Yvonne Strascina - 9626 10



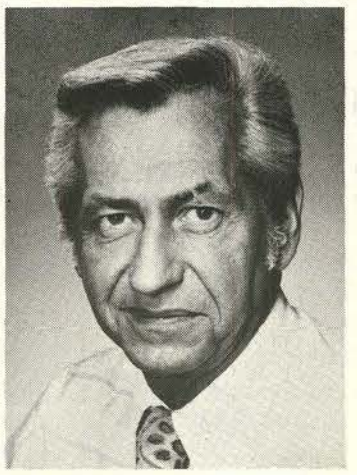
William Armstrong - 2328 20

Tom Jones - 8168 20



Garry Brown - 8324 10

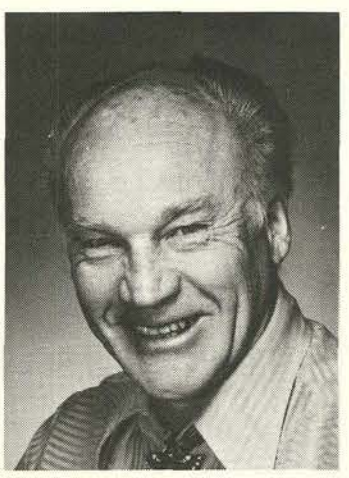
Terry Bersie - 8431 10



John Lewis - 3715 20

Frank Norris - 9751 20

Cathy Banks - 8213 25



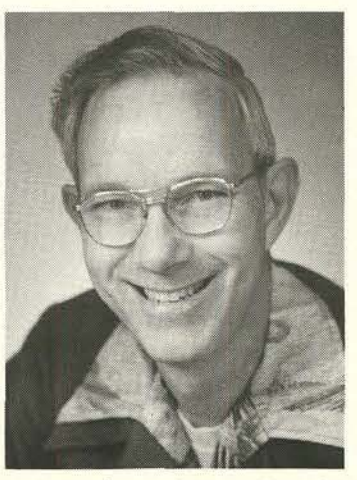
John Sundberg - 1213 25

James Graham - 9583 10

Billy West - 1135 25

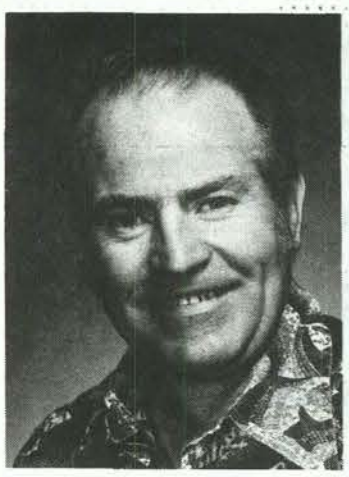
Joseph Keiner - 9523 20

Ray Hinds - 9344 20

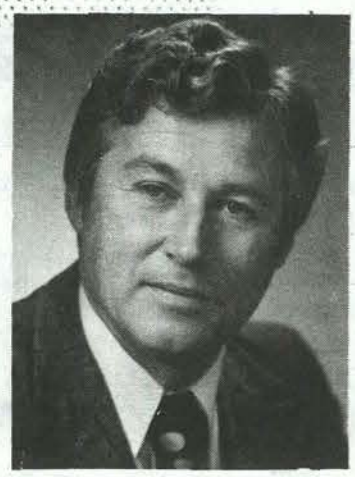


Wil Vandermolen - 8123 20

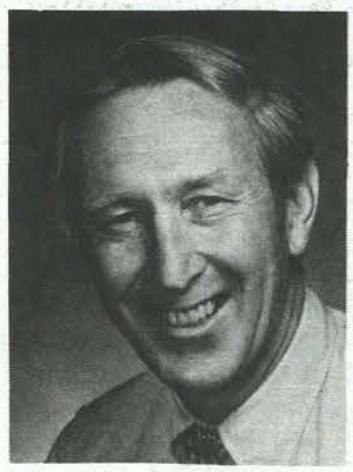
Richard Schreiner - 3251 20



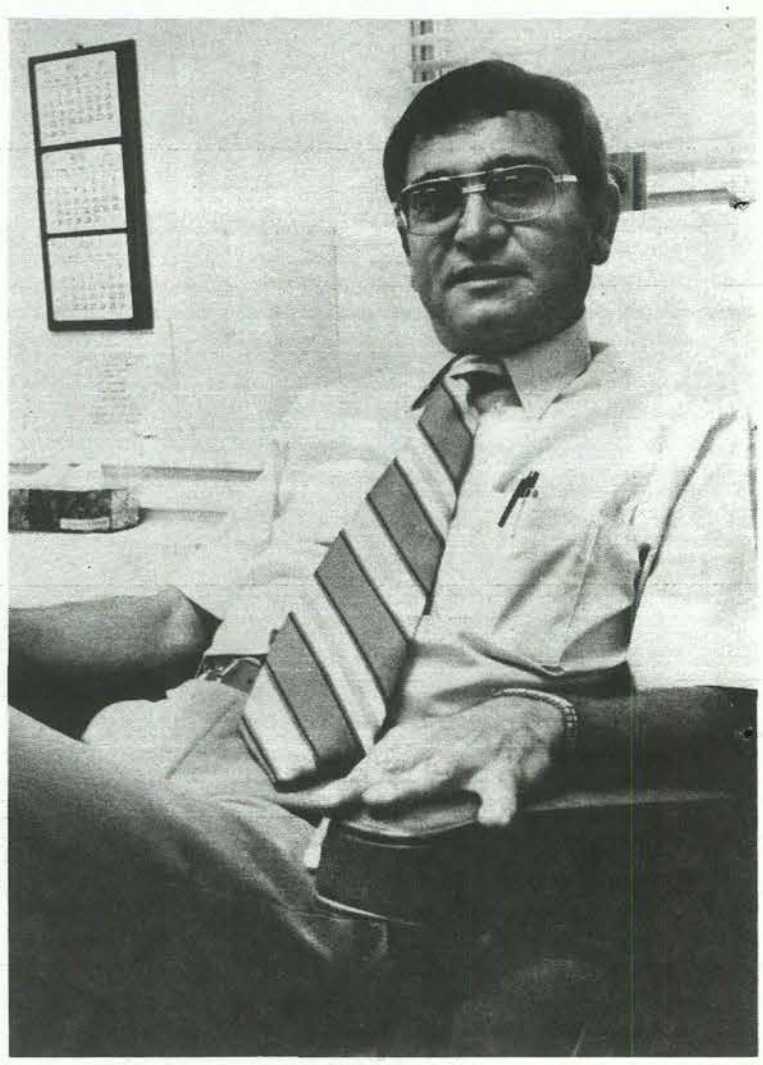
Arlen Baldwin - 2522 20



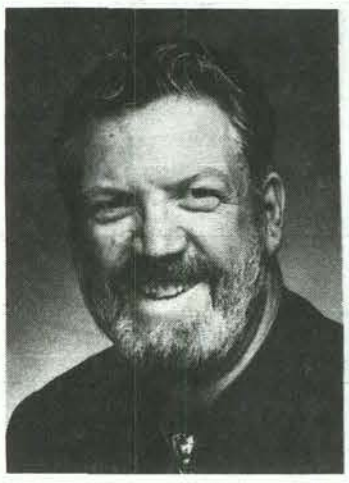
Don Wagner - 8212 20



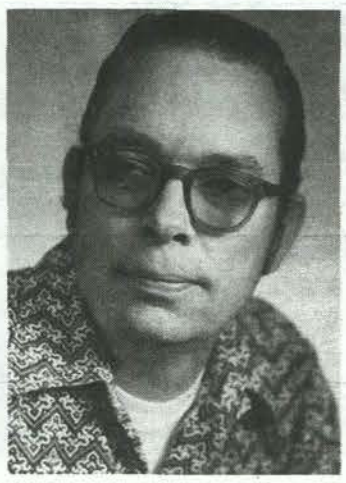
Warren Taylor - 2551 25



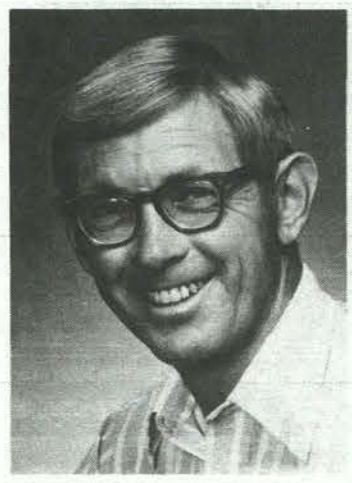
Lawrence Conterno - 3700(WE) 20



Harold Myers - 2551 25



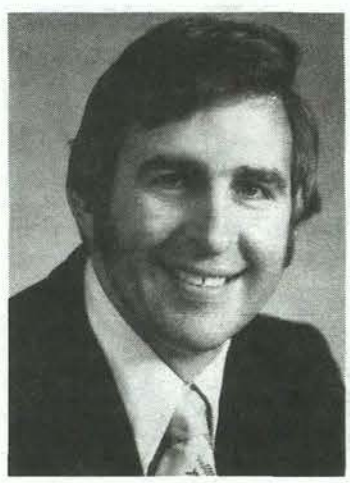
Ken Byrne - 8168 20



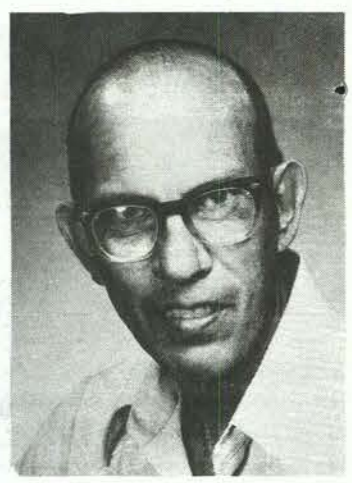
Austin Arthur - 1124 20

Bob Becker - 9581 30

Carl Duimstra - 1125 20



Marlin Pound - 8214 20



Ray Cooper - 9584 10

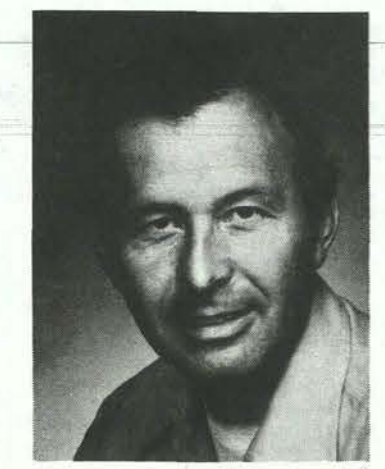
Neal Branson - 9636 25

Joe Lienhard - 8115 10

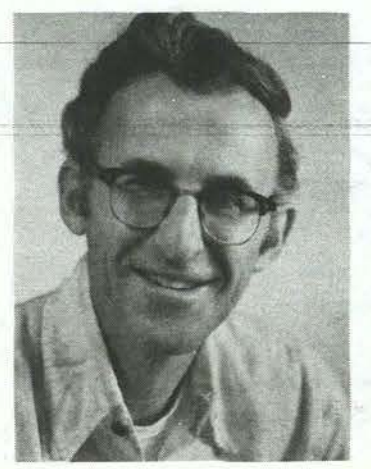
James Vincent - 9711 25

Jose Suazo - 1324 20

Chuck Smith - 9523 25



Henry White - 2142 10



Charlie DeCarli - 8346 15

Richard Ericksen - 5844 10

Richard Womelsduff - 2317 30

Bill Hale - 9421 15

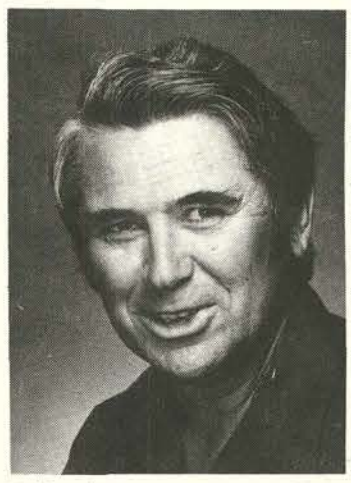
Everitt Davis - 8424 10

Roger Everett - 8158 15

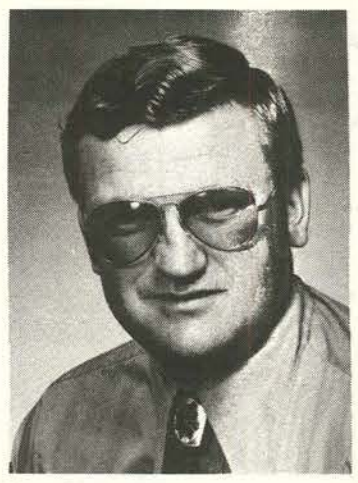
Don Bertholomey - 1716 15

Morrie Karnowsky - 5832 25

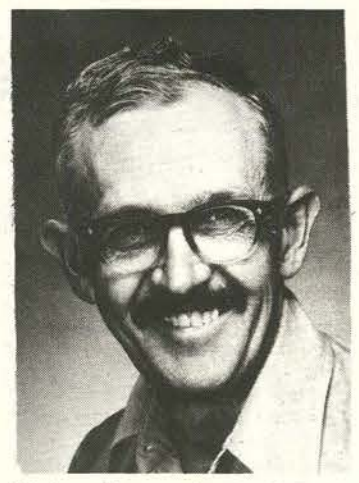
Jim Lovell - 1132 20



Richard Simmons - 9751 20



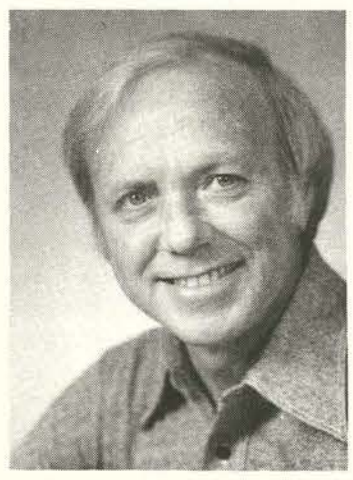
Kurt Putz - 1333 10



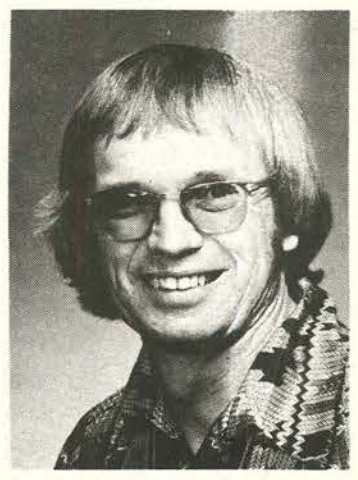
Walter Shoemaker - 5212 25

R. J. Hart - 4311 20

Don Mitchell - 9583 20



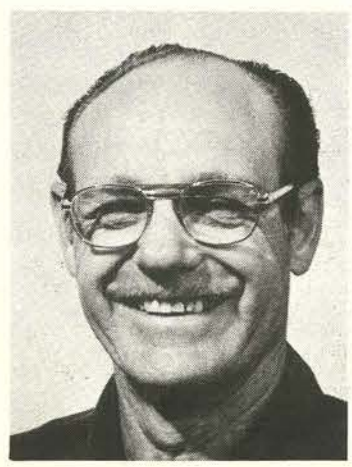
Bob Peterson - 8183 25



David Smallwood - 9332 10

Jim Ridinger - 9521 20

John Duncan - 4312 15



William Albert - 9583 10

George Dyckes - 1712 20

Floyd McFarling - 9512 25

Upper Atmosphere Research

New Gas Chromatograph Developed

An ultra sensitive portable gas chromatograph has been developed at Sandia for upper atmosphere research. Bob Woods (5715), who designed the instrument, reports that it detects trace gases such as freon 11, freon 12 or carbon tetrachloride in densities as low as one part in 10^{12}.

Designed for use in balloon experiments such as Da Vinci and the STRATCOM series, the new instrument may be operated either "hands on" or remotely from a ground station.

"This eliminates many of the disadvantages of former sampling techniques," Bob says. "Previously, we had to take samples and bring these back to the lab for analysis. Inherently that approach had many drawbacks—some atmospheric compounds react with their sampling containers or break down during the warming process to room temperature or degrade during storage. Now we can take the instrument into the atmosphere, continuously monitor changing conditions and, under the control of the operator, zero in on areas of interest.

Collaborating with Bob on the development of the instrument was Leroy Heidt, group leader of the Upper Atmosphere Project, National Center for Atmospheric Research, Boulder, Colo. Larry McConahy (1735) did the electronic packaging.

"Leroy currently has the instrument at NCAR for calibration and testing," Bob says. "It will be flown in a balloon experiment at Yorkton, Canada, later this summer."

Development of the instrument grew out of Sandia's continuing upper atmosphere research studies. Bob developed mass spectrometers for use on rockets during the early days of atmospheric nuclear testing.

As program emphasis shifted to air pollution in the upper atmosphere, Bob developed mass spectrometers to fly on balloon experiments.

"It became obvious," Bob says, "that we needed a gas chromatograph to complement data from the mass spectrometer. Using both instruments will give us much more precision in our measurements.

"Use of the gas chromatograph is not limited to the upper atmosphere," Bob continues. "Since it's small and portable (a 9-in. diameter cylinder about 2 ft. long weighing 30 lbs.), it could be used in any application where sensitive measurements of gas content need to be made—even in an exhaust stack of a generating plant."

JUNK•GOODIES•TRASH•ANTIQUES•KLUNKERS•CREAM PUFFS•HOUSES•HOVELS•LOST•FOUND•WANTED•& THINGS

CLASSIFIED ADVERTISING

Deadline: Friday noon prior to week of publication unless changed by holiday.

RULES

1. Limit 20 words.
2. One ad per issue per category.
3. Submit in writing. No phone-ins.
4. Use home telephone numbers.
5. For active and retired Sandians and ERDA employees.
6. No commercial ads, please.
7. Include name and organization.
8. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

TRASH BAGS, city-approved, $4, S. HW 14 Project. LAB NEWS office, Bldg. 814.

10-SPD BIKE w/lock & chain, $40 or best reasonable offer. Biesterveld, 256-7983.

LAZY BOY wall recliner, cream colored, new $280, 4 mos. old, sell for $200. Berman, 296-5640.

LOWERY ORGAN, Holiday Model LS, 2-keyboard, 13 pedal bass, cherrywood, w/bench, $400. Jolly, 299-6979.

SMITH-CORONA typewriter, 16" carriage, $30; Lindsay water conditioner, $35. Detorie, 299-1868.

GOLF CLUBS: Arnold Palmer woods 1-3-4; McGregor irons 3-PW, $40. Sullivan, 298-0148.

GLASSTITE fiberglass camper shell, cab-high, sliding side windows, currently sells for $550, take $450 or best offer. Follstaedt, 883-1649.

DELTA MARK X ignition system, $18. Binder, 299-2937.

EVINRUDE 7½ HP trolling motor, $55; baby crib, $15. Cook, 294-2348.

CHICKENS, DUCKS & geese, all sizes, some rare breeds of chickens, will trade. Lackey, 898-6638.

GIRLS/BOYS riding clothes: English/Western boots, 3½, $20, $8; chaps, $15; hunt coat/cap, $20 ea.; breeches, shirts, size 8-9. McKay, 256-3911.

IVY GERANIUMS, young ones in 2" pots, 5/$1; mature plants in 9" hanging baskets, $4 & $5. Leenhouts, 299-7856.

CARPETS, used, green, brown, gold, $1.50/yd. including pad. Pope, 255-6702.

GE UPRIGHT, 15 cu. ft. freezer, Ferrell, 292-3641.

BRITTANY SPANIEL pups, AKC reg., hunting & field trial potential, excellent pedigree. Jellison, 296-9155.

BIKES, Schwinn, 10-speed, 1-speed; refrig., portable, $50; bumper hitch for small trailer. Barber, 299-4287.

FOOZBALL TABLE, heavy duty commercial type, coin operated, retail $595, sell for $395 or trade for sail boat. Lassiter, 298-2461.

TENT, 9' sq. umbrella style w/floor. Latta, 256-1259.

WATERDOGS, 2-4" long, $1.50 dz. Price, 867-5719 or 821-1434.

BUTCHER CALVES, grain fed & ready to put in your freezer, $165 & $200. Morrison, 877-7425.

GREENHOUSE, 10x15x8 ft., fiberglass covering, wood structure, 28,000 BTU gas heater, 4500 cu. ft. swamp cooler, thermostat, $350. Emig, 294-3707.

STUDIO COUCH w/slip cover. Renken, 266-5253.

SADDLE, Western, padded, used twice, $150; polyester fleece saddle blanket, $15; hackamore bridle, $8. Martin, 281-3794.

COWBOY BOOTS, black calf, 11½B, custom-crafted, cost $110, sell for $28. Rutledge, 281-1155.

'70 OPENROAD 10½' cabover camper, pressurized water, monomatic, stove, oven, ice box, jacks, tiedowns, powerhood, bunkbed, Camper Dampers, $1600. Martinez, 293-2301.

WHEELED Noah's Ark w/7 pairs animals, handcrafted, $45; Airline stereo portable record player, $30. Dalphin, 265-4029.

REFRIGERATOR, freezer, GE, 12 cu. ft., white, LH hinged door, $100. Booker, 299-3554.

AKC English Springer Spaniels, $100, strong conformation & obedience backgrounds. Mitchiner, 293-6227.

RIMS: two 15" 6-hole, black, $10 ea; one 15" 5-hole, white, $7.50; one 14" 5-hole, black, $5. Hawkinson, 281-5239.

VIOLA, Roth w/case & bow, lists for almost $900, will sell for $700. Houston, 344-9004.

35MM PETRI CAMERA, basic lens 2.8, telephoto lens 65mm, wide angle lens 38mm. Carli, 298-9271.

TRAILER HITCH, receiver section, w/2" sq. tubing, came off of '70 Plymouth, $8. Coalson, 298-0061.

AQUARIUMS; high-chair; booster chair; Fisher Price toys. Sandoval, 294-6091.

REEL-type lawn mower, B&S gas engine, w/catcher, $25; 3-spd. 26" bike, $15. Stuart, 299-9190.

11' WINNEBAGO Indian slide-in camper, self-contained. Curry, 298-9105 after 5.

2 MOUNTED (Chevy) 7.00x15 mud & snow tires, $50; 2 (Sears) room dividers, $8 ea. Baca, 296-8474.

BUNK BED link springs, 2 for $15. Kepler, 298-5652.

MOBILE HOME, 14x68', 2-bdr., 2 bath, 5 appliances, patio cover, Oct. 1 occupancy, $20,600. Teta, 897-0580.

HOOK-RUG TABLE, metal, 63", Wool Design 1976 model, $30. Voelker, 296-0991 after 8:30.

PHOTO ENLARGER, Classic Kodak Precision, w/orig. 50mm lens, all negative carriers & copy stand lamps, Universal condenser—35 mm 2¼x2¾; 75mm lens, $110. Smith, 242-9576.

LAMP TABLE, walnut, 30"x30"x18", $12. Dean, 296-3264 after 5.

AIR CONDITIONER, 28,000 BTU, Sears, window mount, $200; Kenmore washer & dryer, $15 ea., push type lawn mower, $5. Rohwein, 298-8391.

MOBILE HOME: '69 Ranchette, 12x51', new carpet, skirted, located in Four Hills. Stafford, 294-7072 5-7 p.m.

DRYER, elec., $50; bed frame, fits twin or dbl., $20; divan, armless w/walnut frame, foam cushion, $20. Nance, 296-8255.

COLLIE PUPPY, 4 mos., AKC reg., sable, white markings, $115. Hall, 296-2732.

SEARS swing set, $20; GM child's auto seat, $5; wrought iron pedestal base for 36x42" table, $10. Beard, 821-0309

TV, 23" Zenith, best offer. Bertram, 294-8350.

SONY TC800B 5" reel tape recorder w/cigar lighter plug, $45; approx. 20 misc. 5" tapes, $10. Henning, 299-0318.

CONN ORGAN, two manuals, 25-note pedals, 20 voices; w/Leslie speaker system, walnut finishes, service manuals, $875. Bircher, 268-0726.

HEATHKITS: GD-18 mobile siren, new, GD-1021 photobeam relay, new; 25" color TV, new; MM-1 multimeter, others. Braudaway, 281-3691.

ALUMINUM sliding patio door unit w/screen, 6'9" x 8', no glass, $10. Wilkinson, 299-8327.

REG. AQHA MARE & tack, 10-yrs-old, race blood lines, excellent conformation and disposition, Western pleasure and roping. Des Jardin, 898-5181.

DOG HOUSE for small pet, $10. Ottinger, 242-7935.

TRANSPORTATION

'63 CHEVROLET, 4-dr., Powerglide trans., R&H, 283 V8, $195. Zurawski, 294-1078.

'72 OPEL Manta, 4-spd., 40,000 miles, recent tune-up, $1450. Horton, 292-0440.

'74 CORVETTE, silver, black leather interior, T-Tops, PS, PB, PW, AC, 4-spd., luggage rack. Clarkson, 294-5834.

'74 GREMLIN, new tires & battery, 3-spd., 40,000 miles, under book, $1600. Boles, 821-0176.

'76 FORD, blue, ¾ ton, 4-wd, PS, PB, radio, 13,650 miles. Chaplin, 299-6712

'70 INTERNATIONAL, 4-wd, ¾ pickup, cabinet bed, AC, PS, PB, FM, LS differential, 3 tanks, bucket seats, $3000. Barnette, 298-9227.

YAMAHA, 650 cc, customized electronic ignition, Lucas lamp. Wentz, 881-7125.

'72 MONTE CARLO, PS, PB, AC. Sandoval, 294-6091.

'73 VOLVO 164E, sunroof, AC, stereo, new radials, 40,000 miles, best offer over $4000. Herrity, 292-2868.

'68 HONDA 450cc motorcycle, needs bore job & new pistons, otherwise it's complete, $100 or make reasonable offer. Souther, 842-9630.

'57 MERCURY sedan, AT, PS, PB, 4-dr., one owner. Webb, 298-8139.

'71 911 T/Targa #911111969, ice green metalic, Konis, new door/top/trunk seals, AM-FM/stereo, S instruments/decor, 48,500 miles, $8500/offer. Maddox, 281-5683.

'76 DODGE Adventurer pickup, 6-cyl., 18+ mpg, PS, step bumper, radio, 14,000 miles, $3600 or best offer. Follstaedt, 883-1649.

'70 DODGE DART, 6 cyl., 4-dr. Geck, 299-5095.

'69 LTD wagon, AT, PB, PS, AC, new radials, $750. Tollison, 298-9360.

'77 FORD 150 Custom cab w/Ford camper shell, 1100 miles, many extras. King, 296-6144.

SAILBOAT, Robin Class, main & jib sails, centerboard, w/Dilly trailer, $600. Quintenz, 298-3955.

SAILBOAT, Ghost 13, fast 13 ft. daysailer, main & jib, kick up rudder, hiking straps, trailer, $1195. Bouton, 898-3562.

'73 CADILLAC Coupe DeVille, AC, AT, PS, PB, cruise control, etc., below book, make offer. Neel, 821-4270.

'75 FORD VAN, Econoline 100, carpeted, paneled, cassette stereo, 16,000 miles. Jeffery, 277-5033 or after 5 298-1231.

'71 RANCHERO 500 pickup, 1 owner, 302 V8, AC, PS, AT, naugahyde upholstery, 48,700 miles, $1775. Stewart, 296-4341.

'75 BMW R75/6, windjammer w/lowers, 12,500 miles, $2400 or make offer. Williams, 293-3630.

'67 OLDS Delmont 88, low mileage, AC, AT, PS, PB. Morgan, 262-0345.

'75 MOBILE TRAVELER motor home, 18.5 ft., 10-12 mpg, PS, PB, AC, CB, $8000. Lanoue, 877-0915.

'72 CHEV, ¾-ton, Custom Camper pickup w/9' Pilgrim camper, PS, PB, AC, AT, jacks, cab stabilizers, under 21,000 miles, $5200 firm. Brooks, 865-6370 after 5.

22' SUPERIOR motor home, 440 Dodge, 14,500 miles, generator, 2 AC's, cruise, stereo, 2 wardrobes, all storage, sleeps 6, $12,500. Selph, 821-5281.

'71 MERCURY Marquis Brougham, AT, PS, AC, vinyl top, power seats & windows, AM-tape stereo, cruise control, $1500. McIlroy, 299-4977.

'74 FIAT 124 twin overhead cam, 4-spd., stn. wgn., 25 mpg city, AM-FM, steel radials, 28,000 miles, $300 under book at $2195. Morgan, 299-2850.

'71 HONDA CB350, 6300 miles, $375. Kepler, 298-5652.

BICYCLES: Easy Rider 300, 26", 3-spd., ridden less than 2 miles, $75 ea. or both for $140. White, 293-2219.

'76 TOYOTA Chinook mini motor home, 10,000 miles, AC, refrig., furnace, gas range, sink. Sharpe, 869-3073.

'73 YAMAHA TX500, adult ridden, w/rack. Bagley, 821-8247 after 5.

MAN'S 10-spd. bike, 27", $55; single speed, 26", $25. Guttmann, 243-6393.

'69 MERCURY Montego, PS, AC, 51,000 miles, 4-dr., $1200. Benham, 881-2593.

'71 SUZUKI T-250, low miles, new battery & chain, $250. Barnard, 831-4114.

'73 CAPRI, 2000cc, 28,000 miles, 4-spd., AC, AM-FM radio, sun roof, $1995. Langley, 881-7264.

BICYCLE, 20", girl's, coaster brake, high-rise handlebars, $25. Rohwein, 298-8391.

'70 OLDS 98, full power. Bertram, 294-8350.

'63 VW BUS, new tires, $600. Caruthers, 296-5953.

'73 EL CAMINO, full power and air, many extras, $3000 or best offer. Gibbons, 299-2863.

WANTED

10-SPEED BICYCLE, prefer Schwinn. Prevender, 299-5253.

RETIREE for possible plumbing job, must have own transportation & tools, location is Jemez Mountains. Bassett, 898-1840.

PORTABLE kennel for medium sized dog. Jellison, 296-9155.

CHILD'S playhouse. Graham, 298-7005.

CHEST OF DRAWERS, tall, dark wood. Detorie, 299-1868.

GOOD, used practice piano, must have good tone & ability to hold tune. Renken, 296-9713.

OLDER STYLE motorcycle helmet, Sears 7534 or equivalent. Cohen, 299-3039 before 9 p.m.

TO BUY PAPERBACK BOOKS, 15¢ each, for charity project. Recent stuff, no antiques. Bring to 12224 Pineridge NE or 2517 Cutler NE July 5 or 6 between 7 & 9 for cash.

FOR RENT

LG. 1-BDR. apt., unfurnished, utilities paid, patio, AC, carpet, FF refrig., walk-in closet, 541 Espanola SE. Aragon, 293-3238.

LAKE FRONT CABIN, Vallecito Lake, near Durango, lg., modern, 3-bdr., fp, reserve for Sept./Oct. Croll, 881-7235.

LG. ADOBE HOME, near UNM, furnished, from July 31 to Aug. 20, $250. Keith, 265-1620.

3-BDR. HOUSE, lg. den, LR, DR, workshop, NE heights, available July 15, $350/mo. Pearlman, 299-6079.

1-BDR. APT., unfurnished, living area w/fp, closed patio, near base, $160/mo., 840 San Mateo SE. Bargsten, 842-6700.

2-BDR. unfurnished, in 4-plex, color coordinated, outside storage, laundry facilities, near KAFB, 136 Gen. Arnold NE. Cashwell, 292-1150.

SMALL 2-bdr. house, ½ block from UNM, screened porch, fenced back yard, semi-furnished, $200/mo. Abbin, 296-7678, 883-8665.

RUIDOSO CONDOMINIUM: sleeps 6, everything furnished, maid service, racetrack & fishing nearby, call for rates. Fornero, 299-4797.

WORK WANTED

BABYSITTING at my home or yours, reasonable and reliable. Hale, 821-8850.

REAL ESTATE

3-BDR., close in location, 2 baths, FR, patio, $63,000. Tripp, 265-8640.

TRI-LEVEL mountain home, near schools, 2-bdr., den, 1½ baths, smart insulation, fp, 2.8 acres. Shrouf, 281-5228.

EDGEWOOD, 30 acres south side I40, east of realty office in Edgewood, fronts 66, all utilities available, 10 acres or more. Lewing, 10629 Sequoia Dr., Sun City, AZ 85351, 602-974-8571.

ROSWELL, NM: 2-bdr., den home near NMMI, 1500 sq. ft. Smith, 298-7365.

3-BDR., den w/fp, 1¾ bath, lg. covered patio, 1810 sq. ft., near Mall shopping center. Baca, 298-4212.

LOST AND FOUND

LOST—Green plastic bicycle lock & chain, white leather purse, man's black leather wallet, lt. beige shoulder strap purse, man's Rx sunglasses w/lg. lens & clear brown frames, ladies' silver wristwatch—Swiss Germinal-Voltairs—w/mesh band.

FOUND—White & gold clip-on earring, lg. pocket knife w/2 blades, ladybug tie-tac, 8 round plastic containers of filters in box (#NRWP-01300), ladies' turquoise ring.

LOST AND FOUND, Bldg. 832, 264-1657

LUAU • C-CLUB • 4TH OF JULY • STEAK FRY • POLKA SCHLINGELS • LOADED RAFT • HULA

FRIDAY	MONDAY/SATURDAY
1—HAPPY HOUR STEAK FRY III $3.95 (Snack Bar Open) AUGUST II	4—FOURTH OF JULY PICNIC 11-6 Music, Games 20c Beer, $1 Lunch Free to Members
8—HAPPY HOUR ROAST BEEF BUFFET Adults $3.25 Under 12 1.92 JEANNE RICH & FRIENDS *Single Mingle—4:30* *at Annex Pool*	9—VARIETY NIGHT *Der Polka Schlingels* THIRD MAN ON THE MOUNTAIN Food 6 Show 7 Free to Members

WHEELBARROW RACES for all ages are just one of the events slated for the Fourth of July Picnic on Monday. Warming up are Steve Des Jardin and Victor Frazier (YOT's assigned to 2522) and their siblings: Robert Frazier (who was the handicap aboard Steve), James Des Jardin, and Pamela Frazier.

EVERY—Fourth of July picnic is better than the one before. Come out and celebrate in the old-fashioned way. (No, that doesn't mean with all the old fashioneds you can hold; settle for happy hour bars and 20-cent beer.) There will be: sack races, wheelbarrow races, three-legged races, waterfilled balloon tosses, pole climbs for all ages; find the coins in the sand for the six-and-under set; and of course swimming all day. Add to that a $1 lunch (two hog dogs, beans, potato chips) from 11:30 - 3:30; snack bar will be open all day too. The Albuquerque Municipal Band plays from 12 to 2—*bring your horn and sit in!* The whole shebang (hebang?) is free to all members.

PAYDAY—today! Celebrate by heading Clubward for Happy Hour and Steak Fry III and August II.

I—don't know why the Luau is the Club's most popular summertime special. Could be the food—roast pork, fried shrimp, boiled mahi-mahi, candied yams, Maui fried rice, mixed Chinese vegetables, lomi-lomi salmon, half a dozen salads, plus watermelon baskets and a fresh fruit tray. Or it could be the entertainment—South Pacific dances, including hula, Philippine, Tahitian, Samoan fire and knife dances. Maybe it's the special prices on mai tais and other exotic libations. Or the *Mello-tones*. Or even the chance to wear that garish shirt or that wild muumuu you don't get very often. Whatever, it's a great party. Tickets ($6 members, $7 guests) by the 9th; Luau the 16th.

SMILE—singles. On the 8th is the July Single Mingle Bash and Swim Party—get wet inside and out. It's at the Annex Pool (a block south of the Club, or a block west of Wyoming on B Street). We're going with live entertainment—Linda Beatty's back in town! She does some country, a little rock (sort of pebble), some Goodies But Oldies. Happy Hour bar (featuring beer by the pitcher) and chips-and-dips too. Swim (bring your swimwear—our lifeguards don't have skinnydipper-saving licenses), sip, and socialize from 4:30 till ? Fifty cents at the Annex Pool gate.

AND—those of you immersed in teen-hood can smile too. The first July Teen Dance brings a great new band, *Mil-lenium,* to the bandstand. It's 7:30 till 10:30 on the 7th, and it's half a buck for members, a buck for guests. Tickets by parents (unless you're an employee—then just flash your membership card).

SMILE—at a Wolfpacker. They're the people that bring $20 season football tickets to all of us. But hurry to the Office if you want one; tomorrow is the deadline.

THAT'S—a fine German band blitz-krieging the Club for Variety Night on the 9th. Called *Der Polka Schlingels,* they do vunderful, vunderful things to Tunes Teutonic. Then there's Disney's *Third Man on the Mountain,* a mountain-climbing-in-Switzerland spectacular that proves that to get to the top you need pull. Color cartoons too. Inexpensive edibles also.

BECAUSE—they play great music, that's why *Jeanne Rich and Friends* have so many. Come see, hear, dance to, and enjoy Jeanne next Friday at Happy Hour. Roast beef buffet too, with several summery salads.

MY—picnic loving friends (they're the ones who love picnics, not the ones who love *at* picnics) love Wednesday evenings at the Club. That's when the gates swing wide to admit picnic basket-laden members who know how to exploit the patio properly. Swim till 6, then spread out your own repast on the grass. Bring anything you like—except glass.

SALARY—of the average tennis pro may not be high, but he (or she) still has a great racket. No, the Club hasn't hired a pro *yet,* but the Tennis Committee is out for estimates on three, four, and five courts to be built north and west of the patio. Get aboard if you're going to get aboard!

> *HOT FLASH*—One raftload of Clubbers is confirmed for the August 17-24 trip down the Colorado River through the Grand Canyon. Join the waiting list—go if someone cancels or, if 15 sign up, have your own raft.

IS—riding an open observation car pulled by a old steam-belching locomotive along a narrow gauge track through spectacular scenery your idea of heaven? Then get your $12.80 ($4.80 if 11 or under) in to the Office and slip through the pearly gates on July 23 at Chama. Join the Club Car on the Cumbres and Toltec.

A—reminder: Signups are now well underway for the Club trips to Alaska in August (plane, train, boat, and bus) and to Hong Kong in November. More info on these and other trips from the Office or at the Travel Table in the Lobby Fridays from 6 to 7.

JOKE—Baseball is a strange game in which a young man who bravely strikes out on his own gets no praise whatsoever. Another one: Baseball is a game in which the hot players fan the cold ones. Anyway, if you'd like to see how they do it in the majors, join the Wolfpack-sponsored August 6 to 9 trip to Los Angeles to see the Dodgers have a go at, in order to stop, the Reds. Disneyland is optional, extra, and nearby. The package is $143 ($10 less for Wolfpackers). Kids' prices too.